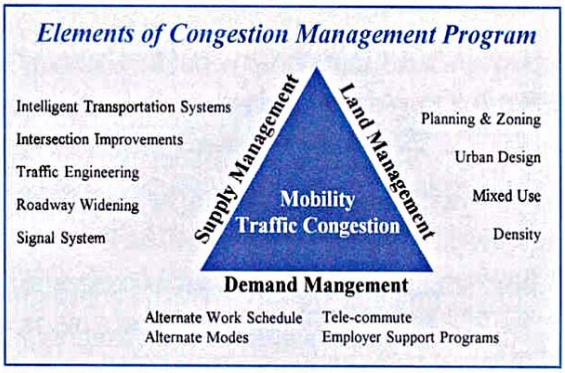
2004 TRAFFIC CONGESTION REPORT

Greensboro Department of TRANSPORTATION

Traffic Congestion is a core concern of our community. The level of traffic congestion experienced by the motoring public on a daily basis is a key measure of Greensboro's quality of life. Greensboro's leaders have long recognized the importance of good mobility and have supported transportation improvement projects over the years to maintain the integrity of our transportation system. A community can not grow and prosper if its transportation system can not meet the demands of a vibrant City. As Greensboro grows, we must continue to evaluate our transportation system, develop transportation improvement projects, and seek funding for those projects.

The 3 basic components of a mobility/congestion reduction program are:



- **Supply Management** - Where improvements or operational charges are made to the existing transportation system to increase capacity. Supply management strategies include roadway widening, intersection improvements, signal timing improvements, improved transit service, reversible lanes, and other ITS.

- **Demand Management** - Demand management strategies are intended to influence the intensity and timing of the demand placed on our transportation system. Such strategies include offering commuters one or more alternative transportation modes or services, providing incentives to travel during non-peak travel times, and incorporating growth management policies into local development issues.

- **Land Use Management** - Exercising control over the trip generating characteristics of the land use can be used to make the resulting demand consistent with the existing transportation infrastructure and desired level of service.

The Greensboro Traffic Congestion Report is a bi-annual report produced by the Greensboro Department of Transportation that identifies deficiencies in our transportation system and recommends transportation improvement projects. The 2004 report focuses primarily on supply management and analyzes current traffic patterns to determine traffic "hot spots." An inventory of existing traffic volumes, existing traffic patterns, and an evaluation of the City's current street network were evaluated to determine operational deficiencies. Various improvement projects such as additional travel lanes, additional turn lanes, lane configuration, traffic signal modifications, and Intelligent Transportation Systems (ITS) were evaluated. Recommended improvements were determined by comparing the benefits of each project to the cost of each project.

Congestion Management System

On July 22, 2004 the City of Greensboro's first Congestion Management System (CMS) was adopted. With our urbanized population of 223,891, the Federal Highway Administration (FHWA) and the Federal Transit Administration (FTA) now require the development and implementation of a Congestion Management System. The CMS examines the entire Metropolitan Planning Organization area; where as the Traffic Congestion Report only provides Citywide data. The CMS examines Greensboro's current roadway network, identifies causes of congestion, and explores options for reducing congestion. You can review the Congestion Management System report on the city's website.

Background

Rapidly increasing vehicle miles traveled combined with changing commuter patterns has lead to significant increases in traffic congestion in our urban areas. The total annual congestion cost (based on wasted time and fuel) in the Nations urban studied areas is $68 billion, which is the value of 3.6 billion hours delay and 5.7 billion gallons of excess fuel consumed.

Traffic congestion affects our community in several ways:

- Local Impacts - Drivers frustrated with chronic congestion look for ways to bypass bottlenecks, oftentimes cutting through residential streets that are not designed to safely accommodate the high volumes and high speeds associated with cut-through traffic. Such bypass traffic often becomes the focus of neighborhood complaints. The number 1 complaint received by GDOT is "speeding traffic in my neighborhood."

- Economic Development - A safe an efficient transportation system is an important selling point for communities that desire to attract new businesses. The safe and efficient movement of goods and services has a direct impact on sound economic growth and productivity.

- Quality of life - To many people, congested/unsafe streets are a symptom of deteriorating quality of life. Many residents have moved to our community to escape urban problems like traffic jams. Greensboro is no longer a 15 minute City, but has become a 30 minute City.

- Road Rage - Increased congestion causes driver frustration and has lead to a phenomenon called "Road Rage." "Road Rage" is associated with aggressive driving behaviors such a speeding, running red lights, tailgating and improper passing. This type of behavior is becoming a leading cause of traffic accidents.

- Environmental Quality - Traffic congestion has a detrimental effect on air quality. Making improvements to the transportation system and changing travel behavior is an important objective to improving our environment.

Traffic Congestion

The capacity of a roadway facility can be defined as the maximum rate at which vehicles reasonably can be expected to traverse a roadway section during a given time period. Congested conditions occur when traffic demand on the roadway system is greater than the available roadway capacity. The results of traffic congestion are long queues of traffic at intersections and unacceptable travel times along roadway sections, which lead to driver frustration and deteriorated quality of life for daily commuters.

The intent of this report is to conduct a comprehensive evaluation of the City's existing transportation system, determine system deficiencies, and recommend improvement projects. The types of roadway improvement projects include intersection improvements, arterial improvements, and ITS projects. Many of the improvement projects identified in this report are funded by or a combination of Traffic Bonds, State Powell Bill funding, and/or Federal and State TIP funding.

Intersection Traffic Congestion

Most traffic congestion in urban areas occurs at the intersection of major/minor arterial streets. Typically, Traffic signals control the flow of traffic at these intersections. Signal timing/phasing, traffic volumes, number/width of travel lanes, and the number/width of turning lanes, determine the capacity at signalized intersections.

More signalized intersections are operating over capacity as traffic volumes continue to grow each year at an average rate of 2%. In 2004 we conducted a capacity analysis at our high growth/high volume intersections and determined that 65 out of 346 intersections operate over capacity during peak travel times.

Figure 1 is a list of our most congested intersections according to capacity. Figure 2 contains intersection improvement projects including: the cost for improvements, the list of proposed improvements at those locations to alleviate congestion, the year the project will begin construction and the current status of the project.

Figure 1—Top 25 Congested Intersections

Rank	Location	Proposed Project	Funding/Cost
1	Galimore Dairy Rd & W. Market St	NCDOT TIP # U-4015 Gallimore Dairy Widening Project	TIP
2	I-40 EB Ramp & Randleman Rd	GDOT Signal System Imp.	$5000
3	Albert Pick/I-40 EB Ramp & NC 68	Recommended NCDOT Interchange Feasibility Study	TBA
4	College/Guilford College Rd & W. Market St	Intersection Imp.	TBA
5	Friendly Ave & Lindell Rd	No project at this time	—
6	Sandy Ridge Rd & US-421 (W. Market St)	NCDOT TIP # R-2611 W. Market St. Widening Project	TIP
7	W. Market St & NC-68/Thatcher Rd	NCDOT TIP # R-2611 W. Market St. Widening Project & Intersection Imp.	TIP
8	Creek Ridge Rd/ Industrial Ave & Elm-Eugene St	GDOT Elm-Eugene St Project	TBA
9	Battleground Ave & Westridge Rd	GDOT/NCDOT Feasibility Study	2000 Bond
10	Battleground Ave & Benjamin Pkwy/Cone Blvd	Intersection Imp.	TBA
11	Benbow Rd & E. Market St	GDOT Signal Systems Imp.	$5000
12	Guilford College Rd & I-40 WB/Swing Rd	Intersection Imp.	TBA
13	Bryan Blvd WB /Horse Pen Creek & New Garden	Intersection Imp.	2000 Bond
14	Green Valley Rd & Pembroke/Westover Terr	Remark Intersection and improve signage	TBA
15	High Point Rd & Mackay Rd	NCDOT TIP # U-2412 High Point Rd Widening Project	TIP
16	Benjamin Pkwy & Elam Ave	No Project at this time	—
17	Bridford Pkwy & Wendover Ave	Intersection Imp.	2000 Bond
18	Lawndale Dr & Pisgah Church Rd	No Project at this time	—
19	Cornwallis Street & Elm Street	Intersection Imp. (On Hold)	TBA
20	Market St & NC 68 NB Ramp	NCDOT TIP # R-2611 Market St Widening Project-NCDOT	TIP
21	Ballinger/New Garden Rd & Fleming Rd	Fleming-Horse Pen Creek Conn. & Urban Loop	2000 Bond
22	Cottage Pl & Lawndale Ave	Study in progress for GDOT Signal System Imp.	$5000
23	Dolley Madison/Meadowview & Market St	No Project at this time	—
24	Coliseum Blvd & Freeman Mill Rd	No Project at this time	—
25	Cridland/Pkwy & Wendover Ave	No Project at this time	—

Figure 2— Intersection Improvement Projects

Intersection	Improvements	Cost	Fiscal-Year	Status
Benjamin Pkwy/Green Valley Rd	Add storage to WB left-turn; add NB left-turn lane	$114,628.50	2004/ 2005	Under Contract
Holden Rd/Market St	Add EB left turn lane, EB, WB & SB right-turn only lane; add storage to NB left-turn lane	$250,000.00	2004/ 2005	Under Contract
Patterson St/Holden Rd/Immanuel St	Add NB left-turn lane & extra storage; add NB right-turn lane w/ storage	$98,579.00	2004/ 2005	Under Contract
Wendover Ave/Big Tree Way	Extended EB left-turn lane storage	$68,591.46	2005/ 2006	Contract Pending
Wendover Ave/Bridford Pkwy	Add EB left-turn lane, NB left & right-turn lanes, SB thru & left-turn lanes	$643,587.28	2005/ 2006	Contract Pending
Wendover Ave/Landmark Center Dr	Add WB right-turn lane, NB left-turn lane, SB thru & left-turn lanes	$125,000.00	2005/ 2006	Contract Pending
Wendover Ave/Stanley Rd	Add SB left-turn lane, WB right-turn lane, NB left & right-turn lanes	$245,542.54	2005/ 2006	Contract Pending
Gallimore Dairy Rd & Market St	Add EB & WB thru-lanes	TBA		No Contract
Market St/Thatcher & NC 68	Add SB left-turn & right-turn lanes, add NB left-turn lane and dual right-turn lanes, add EB & WB thru-lanes	TBA		No Contract
Battleground Ave & Benjamin Pkwy/Cone Blvd	Add NB right-turn lane, add WB left-turn lane, extend SB right-turn lane with extra storage	TBA		No Contract
Guilford College Rd & I-40 ramp/ Swing Rd	Add NB left-turn lane, add WB thru-lane	TBA		No Contract
High Point Rd & Mackay Rd	Add SB right-turn lane, left-turn lane & thru-lane, Add EB 2 thru lanes, Add WB left-turn lane & 2 thru lanes, NB realign Suttonwood Drive	$121,109,000 To be included in NCDOT TIP #U-2412		No Contract
College/Guilford College Rd & W. Market St	Add SB left & right-turn lanes, WB & EB right-turn lane, NB left & right-turn lanes	TBA		No Contract
Creek Ridge Rd/Industrial Ave & Elm-Eugene St.	Radius Improvements on all four corners of intersection	TBA		Contract Pending
Bryan Blvd WB/Horse Pen Creek & New Garden	Add EB left-turn lane, add lane reassignment to NB one left-turn, two thru,-lanes, & a right-turn lane	TBA		No Contract

Arterial Traffic Congestion

The primary street network within the City of Greensboro consists of arterial streets. Urban Arterials are signalized streets that primarily serve through traffic. Many factors influence congestion along arterial streets including number of travel lanes, traffic volumes, median type, number of driveway access points, and signalized intersections. In 2003 a planning level capacity analysis was conducted along our major and minor arterial streets and found that 10.9% of our total analyzed roadway network was over capacity. Currently in Greensboro's Arterial System there are 33 lane miles moderately over capacity and 57 lane miles highly over capacity.

See Figure 3 for a list of Greensboro's most congested arterial streets. These streets were determined to be operating over capacity because existing traffic volumes currently exceed the theoretical capacity of the facility.

Figure 3—Congested Arterial Streets

Thoroughfare	From	To	2003 Volume	V/C Ratio	Comments
High Point Rd	Guilford College Rd	Groometown Rd/ Hilltop Rd	22430	2.04	TIP Imp. Planned
NC 68	Gallimore Dairy Rd	W Market St	50000	1.62	Imp. Complete
Holden Rd	Spring Garden St	W Wendover Ave	42300	1.58	Outer Loop
Hilltop Rd	Guilford College Rd	Cromwell Rd	16376	1.55	GDOT Project
Mackay Rd	Adams Farm Rd	High Point Rd	13300	1.52	TIP Imp. Planned
N Elm St	Cone Blvd	W Wendover Ave	20882	1.5	Project on Hold
Bryan Blvd	NC 68	Burgess Rd/ N Regional Rd	34200	1.48	Imp. Complete
Benjamin Pkwy	Aycock St/Westover Terrace	Bryan Blvd	30741	1.45	Future Imp. Project/ Timing Optimization Project
Merritt Dr	High Point Rd	I-40	12107	1.44	GDOT Project
Wendover Ave	Market St	Summit Ave	52928	1.43	No Project at this time
New Garden Rd	Battleground Ave	Bryan Blvd	16500	1.42	GDOT Project
N Church St	Cornwallis Dr	E Wendover Ave	18960	1.36	GDOT Project
Freeman Mill Rd	Florida St	Downtown	18107	1.22	No Project at this time
Battleground Ave	Lawndale Dr	Pisgah Church Rd	37433	1.21	No Project at this time
Guilford College Rd	Wendover Ave	I-40	28000	1.21	Imp. Complete
Martin Luther King Jr Dr	Alamance Church Rd	I-85/I-40	21115	1.19	No Project at this time
Chimney Rock Rd	Tarrant Rd	W Market St	11800	1.16	Interchange Removed
Alamance Church Rd	Zornbrook Dr	US 421 Hwy	10126	1.15	Planned Feasibility Study
Creek Ridge Rd	Rehobeth Church Rd	I-85	10400	1.13	GDOT Project
Cone Blvd	Summit Ave	Church St	23700	1.12	No Project at this time
Battleground Ave	Westridge Rd	Drawbridge Pkwy	33223	1.11	Future Imp. Project
Spring Garden St	Lindell Rd	Chapman St	18111	1.11	No Project at this time
W Wendover Ave	Holden Rd	Guilford College Rd	47155	1.09	Timing Optimization Project
W Friendly Ave	Kemp Rd	Wendover Ave	25066	1.07	No Project at this time

Intelligent Transportation Systems (ITS)

Increased roadway capacity and reducing traffic congestion has traditionally been accomplished through roadway widening projects. Roadway widening projects are becoming more and more difficult to construct because of environmental issues, political issues, and the high cost of acquiring right of way along developed areas. Intelligent Transportation Systems (ITS) offer several tools to improve roadway capacity without the impacts of traditional roadway widening projects and give our city the opportunity to increase the efficiency of the transportation system without adding additional capacity to the roadways. ITS improves roadway capacity through the use of advanced technologies and communications such as computerized traffic signal systems, traffic surveillance cameras, advance traveler information, smart transit systems, reversible lanes, and variable message signs.

Signal System Upgrade

The city has programmed a citywide signal system upgrade to provide more efficient operation of the traffic signals in the region. The new system will be monitored from a new central management center. The system includes a new central computer, intersection controllers, fiber optic communication network and upgraded field equipment. The project is scheduled to begin in 2008.

The City has implemented new timing optimization improvement projects along the following Corridors: Benjamin Pkwy, Wendover Ave, and E. Lee St. The improvements prove to make the Corridors more efficient by implementing lead/lag left-turn phasing.

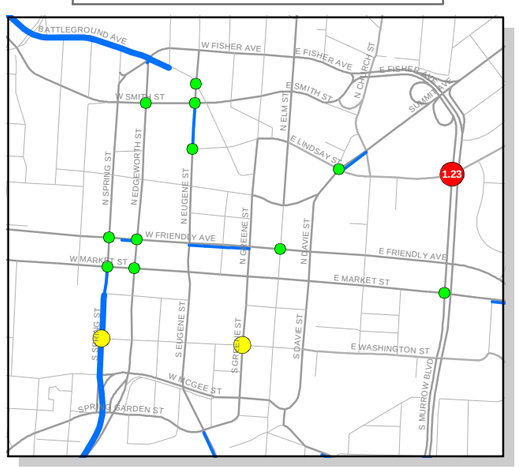
The City of Greensboro has been working with NCDOT on the development of a Regional ITS plan that identifies ITS projects for the Triad Region. The following ITS Projects have been identified in the Regional Plan to manage traffic congestion in Greensboro:

ITS PROJECTS

PROJECTS:	DESCRIPTION:	COST:
Signal System	▪ Replace antiquated twisted pair copper communications units. ▪ New fiber optic communications network. ▪ Expand system boundaries reflecting City's expanding service area. ▪ New advance traffic signal control hardware. ▪ Enhanced system operator software. ▪ Continue installing sixty (60) video surveillance cameras to monitor traffic and pro vide real time information to motorist. ▪ Install vehicle detection to report speeds and volumes along major routes. ▪ Information will be connected to smart map. Real time traffic information map providing information about congested roadway.	$25,000,000
NCDOT Expand Freeway Management System	Expand VMS/CCTV locations along interstates and freeways	$12,000,000
Arterial Congestion Management	Develop ITS projects such as reversible lanes, VMS and cameras along congested corridors.	$5,000,000
Kiosks	Install traffic information kiosks at local/regional attractions, to provide real-time traffic information.	$750,000
Existing Closed Circuit Television (CCTV) Contract	7 new CCTV locations, 2 remote work stations, upgrade 3 existing CCTV locations to dome type cameras	$330,000

2004 Congestion Management Program

Central Business District



Legend

Volume to Capacity Ratio

- < 0.8
- 0.8 - 1.0
- 1.0 - 1.12
- > 1.12

Corridor Congestion

- Acceptable
- Moderately Congested
- Highly Congested